UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19th November 2008*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claims **1**-**16** are pending with claim **16** being new

This is a Non-Final action

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

Claims 1, 6, 10, 12, 13, 14 and 15 are rejected under 35 U.S.C. 112, second

paragraph, as being indefinite for failing to particularly point out and distinctly claim the

subject matter, e.g. the terms *"resources"* and *"resource* level scheduler," which

applicant regards as the invention. The applicants are kindly requested to define

"resources" within the claim body.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can

be found in a prior Office action.

Claims 1, 2, 4, 8, 9, 10 and 12-15 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Wallmeier (US 6553033 B1) in view of Guidos (US 4725836).

Claim 1: Wallmeier shows a scheduler device for scheduling transmission of data

from a plurality of queues in a source node to a plurality of destination nodes (e.g. LICs

or to other SMUs through intermediate switch **see diagram *1* below) via a plurality of outlet

ports of the source node (figs. *1* & *2*), the scheduler device comprising:

a plurality of servers (e.g. SMUs), each being associated with a respective one of

a plurality of resources (fig. *1*: the "tunnel" between the SMUs and an intermediate "switch")

and each comprising a scheduler module (e.g. WFQ scheduler; col. 4 lines 9-13) which is

independent for each of the servers (col. 3 lines 46-51),

wherein each of said outlet ports is associated with a respective one of the

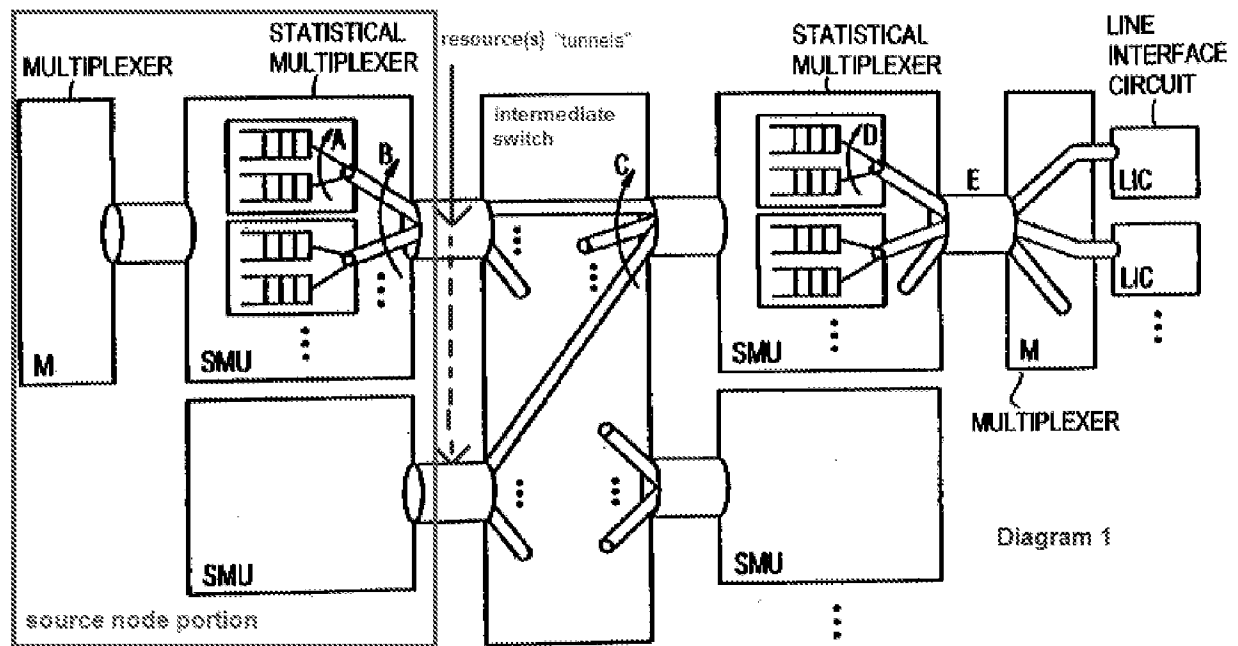plurality of resources (**see diagram *1* below).

However, Wallmeier does not *expressively* show the data is transmitted from a

source node to a destination node via an outlet port and *a corresponding resource*,

wherein at least one of the plurality of resources is used for transmitting data to more

than one of the plurality of destination nodes, and wherein at least one of the plurality of

resources is used for transmitting data to *subset of the plurality of destination nodes.*

Guidos teaches the data is transmitted from a source node to a destination node

via an outlet port and a corresponding resource (fig. 4: CPU, as source, wherein output port

can be driver 26 or 28 corresponding to buses 22 and 24 respectively; fig. 2: buses 22 and 24,

as resources, that carry data to destination terminals T-1 and T-2), wherein at least one of the

plurality of resources is used for transmitting data to more than one of the plurality of

destination nodes (fig. 2: bus 22 can transmit data to T-1 and T-2 destinations), and wherein

at least one of the plurality of resources is used for transmitting data to subset of the

plurality of destination nodes (col. 5 lines 46-52: e.g. bus 24 carries data to subset

destinations T-1 and T-2 – there can be more than T-1 and T-2 terminals as shown in col. 5

lines 35-37 wherein up to T-n terminals configuration can be implemented wherein T-n can be

one of a subset of terminals not connected by all buses).

It would have been obvious to one of ordinary skill in the art at the time the

invention was created to modify and upgrade the resource ("tunnel") of Wallmeier into

plurality of resources ("buses") wherein each bus carries data to a subset of destination
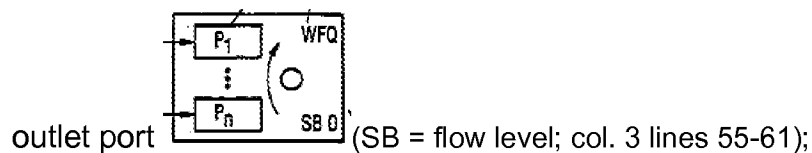
nodes as taught by Guidos to enable a plurality of terminals to access a source without

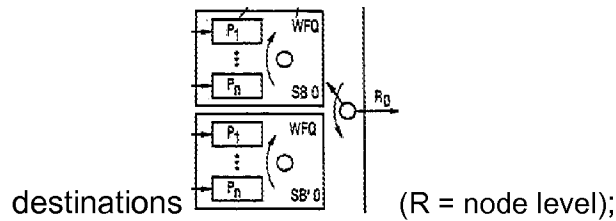complex time-division arrangements (col. 2 lines 30-31).

Diagram 1

Claims 2 and 15, applied to claims 1 and 2: Wallmeier, modified by Guidos,

further shows in figure 2 that the scheduler module comprises a plurality of stages

corresponding respectively to a plurality of scheduling schemes using different criteria

(col. 3 lines 31-35 & 46-52); wherein the criteria is:

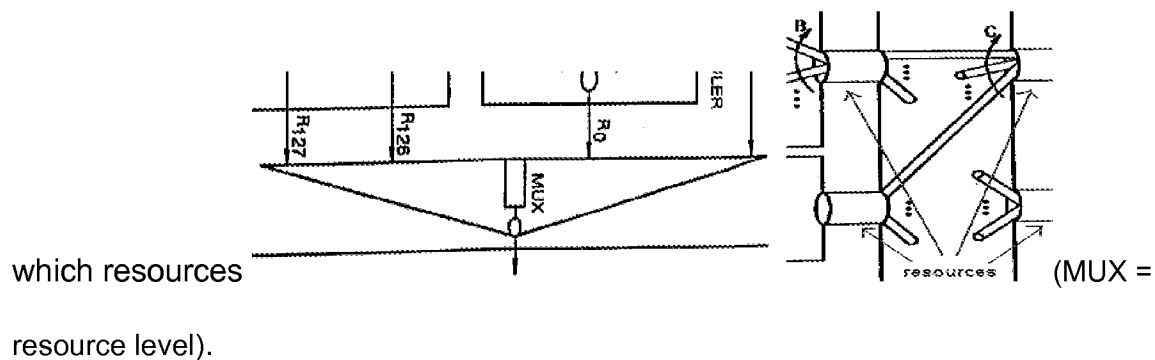flow level scheduler scheduling between competing flows heading for the same

outlet port (SB = flow level; col. 3 lines 55-61);

node level scheduling which arbitrates between loads corresponding to different

destinations [figure] (R = node level);

a resource level scheduler which take account of which nodes are connected to

which resources [figure] (MUX =

resource level).

Claim 4, applied to claim 1: Wallmeier, modified by Guidos, further shows that

the scheduling module comprises a weighted fair queuing scheduling module (col. 3 lines

29-33).

Claim 8, applied to claim 1: Wallmeier, modified by Guidos, further shows in

figure 1 (and diagram 1) that a node comprising a scheduler device comprising a plurality

of queues (in the SMUs) for sending data to a plurality of destination nodes (LICs), and a

plurality of outlet ports (e.g. "tunnels").

Claim 9, applied to claim 1: Wallmeier, modified by Guidos, further shows the

system comprising at least one source node (**see diagram 1 above: the examiner

considers the boxed portion as the source node).

Claim 10, applied to claim 1: Wallmeier, modified by Guidos, further shows each

scheduler schedules data transmission on an outlet port associated with a resource that

is shared with a destination node of the data (col. 3 lines 46-51; fig. 2: $R_{0...127}$ → MUX).

Claim 12, applied to claim 1: Wallmeier, modified by Guidos, further shows each

scheduler module is independent such that each scheduler (SB) module takes into

account specific features of a respective resource with which respective server (SMU) of

the scheduler is associated (fig. 2; col. 4 lines 40-54).

Claim 13, applied to claim 1: Guidos further mentions the plurality of resources

correspond to a transmission capacity (col. 1 lines 14-20).

Claim 14, applied to claim 13: Guidos further discloses the plurality of resources

correspond to a plurality of wavelengths on an optical transmission line (col. 1 lines 14-

20; col. 7 line 65 – col. 8 line 5).

Claim 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Wallmeier (US 6553033 B1) in view of Guidos (US 4725836), applied to claim 1, and in

further view of Fan et al (US 6408005, "Fan").

Consider claim 3, and as applied to claim 1: Wallmeier, as modified by Guidos,

disclose the claimed invention except a cyclical round-robin scheduling means. In the

same field of endeavor, Fan teaches queues are visited in a cyclic order in a round-

robin scheduling scheme (col. 1 lines 37-39). It would have been obvious for a person of

ordinary skills in the art at the time when the invention was made to modify the

scheduling mode of Wallmeier, as modified by Guidos, to a cyclical round-robin

scheduling mode as taught by Fan, in order to avoid processes from being denied of necessary resources.

Consider claim 5, and as applied to claim 1: Wallmeier, as modified by Guidos, disclose the claimed invention except *specifically* mentioning the scheduling means are dependent on a set of static and/or dynamic weights. Fan teaches static and/or dynamic scheduling methods dependent on weights (col. *8* lines *63-67*, col. *9* lines *1-9*). It would have been obvious for a person of ordinary skills in the art at the time when the invention was made to modify the scheduling device of Wallmeier, as modified by Guidos, to the scheduling means that are dependent on a set of static and/or dynamic weights as taught by Fan in order to allow flexible distribution of bandwidth.

Claim 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallmeier (US 6553033 B1) in view of Guidos (US 4725836), applied to claims 1 and 6, and in further view of Biroux et al (*Quality of Service in ATM Networks: State-of-the-Art Traffic Management*, "Biroux").

Consider claims 6 and 7, and as applied to claims 1 and 6: Wallmeier, as modified by Guidos, disclose the claimed invention except *specifically* showing the first and second sets of weights, in which each weight represent a relative weight of the traffic of each node; and as a percentage of resource allocated to each node – relative of the total traffic of the plurality of nodes. Biroux discloses the concept of the weighted round-robin method that calculates relative allocation (ratio) using each connection's weight (w_i), the link capacity of the system, as well as the total (all) weights $\sum W_i$ where i

can be from 1 to the total (N) number of cell slots (as resources/traffic of nodes) available

(pg. *100* lines *22-33*, pg. *105* lines *1-14*). It would have been obvious to a person of

ordinary skills in the art at the time the invention was created to modify the scheduling

weighing factors of Wallmeier, as modified by Guidos, into being dependent each

weight represent a relative weight of the traffic of each node; and as a percentage of

resource allocated to each node – relative of the total traffic of the plurality of nodes as

taught by Biroux, in order to assign resources to each connection fairly.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Wallmeier (US 6553033 B1) in view of Guidos (US 4725836), applied to claim 1, and in

further view of Bisson et al (US 2003/0059159 A1, "Bisson").

Claim 11, applied to claim 1: Wallmeier, modified by Guidos, disclose the claimed

invention yet does not very *specifically* mention the source node as a concentrator of a

dual bus optical ring network and wherein the plurality of destination nodes are Optical

Packet Add/Drop MUXes. Bisson shows in figure 1 a hub (concentrator) is as an access

point to a network wherein traffic on a group of wavelengths is addressed to stations

(destinations) on the ring in which each station is an optical add/drop multiplexer (OADM)

station ([0016] lines 13-18). It would have been obvious to one of ordinary skill in the art

at the time the invention was created to implement the scheduling functions of

Wallmeier, modified by Guidos, to be used in the concentrator and OADMs of Bisson to

allow efficient drop of portion of the traffic that is addressed to one or more of the

wavelengths from the group and to add its own traffic addressed to the hub, while at the same time allowing all the wavelengths sent and received by the hub to circulate freely.

Claims 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallmeier (US 6553033 B1) in view of Guidos (US 4725836), applied to claim 1, and in further view of Siu et al (US 2008/0310418 A1, "Siu").

Claim 16: Wallmeier, in combination with Guidos, discloses the source node comprises a plurality of buffers which store data prior to the data being transmitted (fig. 2: each SB has plurality of queues to be scheduled); yet does not expressively mention "wherein each of the plurality of buffers corresponds to a different destination node." Siu teaches each of the plurality of buffers corresponds to a different destination node ([0027]: Each parallel output data packet originates from a *single queue*, which is used to store data packets intended for a *single destination*; fig. 3: queues 314_{a-n} to outputs 318_{a-n} respectively). It would have been obvious to one of ordinary skill in the art when the invention was created to modify the queue structure of Wallmeier, in combination with Guidos, to the "each of the plurality of buffers corresponds to a different destination node" structure of Siu to achieve high speed, high efficiency routing with a relatively low chip count ([0008]).

Response to Arguments

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. Golla et al, US 7023840 B2: multiserver scheduling system and method for a fast switching element

2. Grant et al, US 5548590: a scheduler maintains a plurality of destination queues (Q.sub.p1 - Q.sub.pi) which correspond respectively with each of the ports (p1-pi); see fig. 2.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xavier Wong whose telephone number is 571.270.1780. The examiner can normally be reached on Monday through Friday 8:30 am - 6:00 pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571.272.3174. The fax phone number for the organization where this application or proceeding is assigned is 571.273.8300.

Information regarding the status of an application may be obtained from the

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Business Center (EBC) at 866.217.9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800.786.9199 (IN USA OR CANADA) or 571.272.1000.

/Xavier Szewai Wong/   /Seema S. Rao/
x.s.w   Supervisory Patent Examiner, Art
10th February 2009   Unit 2416